Section II: Other LAER/BACT Determinations

Application No.: 220

Equipment Category – I.C. Engine, Stationary, Non-Emergency

1. GENERAL INFORMATION

DATE: 5/14/2004

A. MANUFACTURER: Wartsila

B. TYPE: Four-Cycle, Lean-Burn

C. MODEL: 18V220SG

D. STYLE:

E. APPLICABLE AQMD RULES:

F. COST: $ (NA) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: HRS/DAY DAYS/WK WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 220

A. FUNCTION: Sixteen engines driving generators, constituting 44 MW peaking plant. Power is sold to PG&E grid.

B. MAXIMUM HEAT INPUT:

C. MAXIMUM THROUGHPUT: 3870 hp

D. BURNER INFORMATION: NO.: TYPE:

E. PRIMARY FUEL: Natural Gas

F. OTHER FUEL: None

G. OPERATING CONDITIONS: Peaking service

3. COMPANY INFORMATION

APP. NO.: 220

A. NAME: NEO California Power, LLC

B. SIC CODE: 4911

C. ADDRESS: 970 Diamond Avenue
CITY: Red Bluff STATE: CA ZIP: 96080

D. CONTACT PERSON: Tim Hemig

E. PHONE NO.: 760-268-4000

4. PERMIT INFORMATION

APP. NO.: 220

A. AGENCY: Tehama County APCD

B. APPLICATION TYPE: new construction

C. AGENCY CONTACT PERSON: Curtis Wentworth

D. PHONE NO.: 530-527-3717

E. PERMIT TO CONSTRUCT/OPERATE INFORMATION: P/C NO.: 220 ISSUANCE DATE: 4/17/2001
☐ CHECK IF NO P/C P/O NO.: 220 ISSUANCE DATE: 5/22/2002

F. START-UP DATE: Late fall 2001

5. EMISSION INFORMATION

APP. NO.: 220

A. PERMIT

A1. PERMIT LIMIT: PPMVD@15%O2 (g/bhp-hr): NOx-9 (0.15), NMHC-25 (0.15), CO-56 (0.6). Ammonia not to exceeed 10 ppmvd. SOx not to exceed .000829 lb/MMBtu. PM10 not to exceed .02 g/bhp-hr. Emissions may exceed these limits during startups and shutdowns (maximum of one hour each case). Aggregate NOx and VOC from all 16 engines limited to 24.99 tons per year (to avoid offsets). Engine operation limited to 6,090 hours per year per engine (to insure NOx and VOC caps are met).

A2. BACT/LAER DETERMINATION: Above concentration limits on NOx, CO and VOC.

A3. BASIS OF THE BACT/LAER DETERMINATION: CARB Guidance for Permitting of Electrical Generation Technologies

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: Wartsila (engines), Miratech (selective catalytic NOx reduction systems), Oxicat (oxidation catalyst)

B2. TYPE: Engines are turbocharged and aftercooled. Selective catalytic reduction (SCR) for NOx control. Oxidation catalyst for control of CO and NMHC.

B3. DESCRIPTION: SCR systems (one per engine) are catalytic reactors (Miratech Model HUG EM77/6) promoting reaction between injected urea and NOx to form N2 and H2O. Unreacted urea produces ammonia emissions. The oxidation catalyst on each engine exhaust, immediately following SCR catalyst, promotes oxidation of CO and hydrocarbons (and possibly ammonia) by residual flue gas O2.

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 220 ISSUANCE DATE: 4/17/2001
P/O NO.: 220 ISSUANCE DATE: 5/22/2002

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:
ACTUAL CONTAMINANT LOADING: BLOWER HP:

B6. WARRANTY: System supplier guaranteed the emission limits in the permit.

B7. PRIMARY POLLUTANTS: NOx, CO, NMHC, PM10

B8. SECONDARY POLLUTANTS: Ammonia

B9. SPACE REQUIREMENT:

B10. LIMITATIONS: B11. UNUSED

B12. OPERATING HISTORY: The engines and emission control systems have been in on-demand service since startup in late fall 2001. No equipment breakdowns caused by the pollution control system have been reported. The operating company contact reports that there has been no problem meeting the emission limits.

B13. UNUSED B14. UNUSED

C. CONTROL EQUIPMENT COSTS

C1. CAPITAL COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN EQUIPMENT COST
EQUIPMENT: $ INSTALLATION: $ (NA) SOURCE OF COST DATA:

C2. ANNUAL OPERATING COST: $ (NA) SOURCE OF COST DATA:

5. EMISSION INFORMATION

APP. NO.: 220

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: DATE:

D2. COMPLIANCE DEMONSTRATION: Initial source test on all engines, annual source test on 2 engines selected by APCD, quarterly test on all engines that operate in quarter using portable analyzer (NOx and CO).

D3. VARIANCE: NO. OF VARIANCES: None DATES:

CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: None DATES:

CAUSES:

D5. MAINTENANCE REQUIREMENTS: Periodic rotation and/or replacement of catalyst blocks

D6. UNUSED

D7. SOURCE TEST/PERFORMANCE DATA RESULTS AND ANALYSIS:

DATE OF SOURCE TEST: 10/16-19/01, 1/21/03, 2/17-18/04 CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICIENCY:

SOURCE TEST/PERFORMANCE DATA:

	October 16-19, 2001		1/21/03		2/17-18/04	
	All 16 Engines		Engine	Engine	Eng.	Eng.
	Range	Average	#6	#14	#14	#15
O2, % (dry vol.)	11.85 - 12.57	12.30	12.19	12.65	11.67	11.89
PPMVD@15%O2:						
NOx	4.02 - 5.64	4.82	7.1	7.42	8.81	7.89
CO	9.2 - 29.3	16.3	19.0	22.5	19.0	19.0
NMHC as CH4	3.0 - 5.8	4.3	3.8	4.2	15.5	14.2
NH3	0.32 - 0.82	0.44	0.64	0.88	1.43	2.84

OPERATING CONDITIONS: 100% load (3870 hp, 2800 kW)

TEST METHODS: The 2001 test was the initial source test (all 16 engines), and the 2003 and 2004 tests were annual tests (2 engines, selected by APCD, each case). The results shown are each an average of three 20-minute measurements. An APCD observer was present in all cases.

6. COMMENTS

APP. NO.: 220

The upward trends in NOx, ammonia and VOC may indicated that the catalysts need more frequent cleaning. A representative from the SCR catalyst manufacturer was present at the 2004 test and commented that the SCR catalyst appeared to be in need of cleaning and that if the catalyst were cleaner the NOx and ammonia emissions would be lower.